

WHAT IS CLAIMED IS:

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1. A color converting device converting input CMYK data into output color data in a predetermined different format, the device comprising:

10 a contrast emphasizing unit emphasizing a contrast of the output color data corresponding to the CMYK data representing a black-character color more than a contrast of the output color data corresponding to the CMYK data representing a non-black-character color.

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2. A color converting device converting input CMYK data into output color data in a predetermined different format, the device comprising:

20 a color conversion profile representing a correspondence of the CMYK data with the output color data; and

25 a color converting unit converting the CMYK data into the output color data by referring to said

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color conversion profile,

wherein said color conversion profile has a characteristic of emphasizing a contrast of the output color data corresponding to the CMYK data representing a black-character color more than a contrast of the output color data corresponding to the CMYK data representing a non-black-character color.

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3. A color converting device converting input CMYK data into output color data in a predetermined different format, the device comprising:

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a CMYK/colorimetric-value conversion unit converting the CMYK data into a colorimetric value to be measured with respect to an image formed from the CMYK data by an image forming device;

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a black-character color judging unit judging whether or not the CMYK data represents a black-character color;

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a colorimetric value correction unit correcting said colorimetric value by performing a contrast correction appropriate for a black-character color to the colorimetric value converted by said

CMYK/colorimetric-value conversion unit from the CMYK data judged to represent the black-character color by said black-character color judging unit, and by performing a contrast correction appropriate for a non-
5 black-character color to the colorimetric value converted by said CMYK/colorimetric-value conversion unit from the CMYK data judged to represent the non-black-character color by said black-character color judging unit; and

10 a colorimetric-value/output-color-data conversion unit converting said colorimetric value corrected by said colorimetric value correction unit into the output color data,

15 wherein a contrast of the output color data corresponding to the CMYK data judged to represent the black-character color is emphasized more than a contrast of the output color data corresponding to the CMYK data judged to represent the non-black-character color.

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4. The color converting device as claimed in claim 3, wherein said colorimetric value correction unit
25 performs the contrast correction by linearly

transforming a dynamic range of a luminous component of the colorimetric value determined appropriate for each of the black-character color and the non-black-character color into a predetermined dynamic range.

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10 5. The color converting device as claimed in claim 3, wherein said colorimetric value correction unit performs the contrast correction appropriate for the black-character color to said colorimetric value converted from said CMYK data judged to represent the black-character color by linearly transforming a dynamic
15 range of a luminous component of said colorimetric value determined appropriately for the black-character color into a predetermined dynamic range, and performs the contrast correction appropriate for the non-black-character color to said colorimetric value converted
20 from said CMYK data judged to represent the non-black-character color by linearly transforming a dynamic range of a luminous component of said colorimetric value determined appropriately for the non-black-character color into a predetermined dynamic range.

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6. The color converting device as claimed in claim 3, wherein said colorimetric value correction unit corrects said colorimetric value converted from said CMYK data judged to represent the black-character color so that a chroma of said colorimetric value becomes zero.

7. The color converting device as claimed in claim 3, further comprising a non-black-character color judging unit judges from the CMYK data in a vicinity of a pixel of interest whether or not there exists a pixel of the non-black-character color having a luminosity lower than a predetermined luminosity in the vicinity of said pixel of interest, wherein said colorimetric value correction unit performs said contrast correction appropriate for the non-black-character color with respect to said pixel of interest when said non-black-character color judging unit judges that there exists the pixel of the non-black-character color having the luminosity lower than the predetermined luminosity in the vicinity of said pixel of interest.

8. A color conversion profile creating device creating a color conversion profile used for converting CMYK data into output color data in a predetermined different format, the device comprising:

5 a CMYK data generation unit generating the CMYK data;

a colorimetric value converting unit converting said CMYK data generated by said CMYK data generation unit into a colorimetric value to be measured
10 with respect to an image formed from said CMYK data by an image forming device;

a black-character color judging unit judging whether or not said CMYK data generated by said CMYK data generation unit represents a black-character color;

15 a colorimetric value correcting unit correcting said colorimetric value by performing a contrast correction appropriate for a black-character color to the colorimetric value converted by said colorimetric value converting unit from the CMYK data
20 judged to represent the black-character color by said black-character color judging unit, and by performing a contrast correction appropriate for a non-black-character color to the colorimetric value converted by said colorimetric value converting unit from the CMYK
25 data judged to represent the non-black-character color

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by said black-character color judging unit; and

a color conversion profile setting unit
setting said color conversion profile by using said
colorimetric value corrected by said colorimetric value
5 correcting unit,

wherein said color conversion profile has a
characteristic of emphasizing a contrast of the output
color data corresponding to the CMYK data representing
the black-character color more than a contrast of the
10 output color data corresponding to the CMYK data
representing the non-black-character color.

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9. The color conversion profile creating
device as claimed in claim 8, wherein said colorimetric
value correcting unit performs the contrast correction
by linearly transforming a dynamic range of a luminous
20 component of the colorimetric value determined
appropriate for each of the black-character color and
the non-black-character color into a predetermined
dynamic range.

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10. The color conversion profile creating device as claimed in claim 8, wherein said colorimetric value correcting unit performs the contrast correction appropriate for the black-character color to said colorimetric value converted from said CMYK data judged to represent the black-character color by linearly transforming a dynamic range of a luminous component of said colorimetric value determined appropriately for the black-character color into a predetermined dynamic range, and performs the contrast correction appropriate for the non-black-character color to said colorimetric value converted from said CMYK data judged to represent the non-black-character color by linearly transforming a dynamic range of a luminous component of said colorimetric value determined appropriately for the non-black-character color into a predetermined dynamic range.

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11. The color conversion profile creating device as claimed in claim 8, wherein said colorimetric value correcting unit corrects said colorimetric value converted from said CMYK data judged to represent the black-character color so that a chroma of said

colorimetric value becomes zero.

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12. The color conversion profile creating device as claimed in claim 8, wherein said CMYK data generation unit generates the CMYK data corresponding to a plurality of representative points in a four-
10 dimensional color space defined by four components of CMYK, and said color conversion profile setting unit creates a four-dimensional lookup table as said color conversion profile, the four-dimensional lookup table representing correspondences of said representative
15 points with respective values of the output color data.

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13. A color conversion profile creating method creating a color conversion profile used for converting CMYK data into output color data in a predetermined different format, the method comprising:

the CMYK data generating step of generating
25 the CMYK data;

the colorimetric value converting step of
converting said CMYK data generated by said CMYK data
generating step into a colorimetric value to be measured
with respect to an image formed from said CMYK data by
5 an image forming device;

the black-character color judging step of
judging whether or not said CMYK data generated by said
CMYK data generating step represents a black-character
color;

10 the colorimetric value correcting step of
correcting said colorimetric value by performing a
contrast correction appropriate for a black-character
color to the colorimetric value converted by said
colorimetric value converting step from the CMYK data
15 judged to represent the black-character color by said
black-character color judging step, and by performing a
contrast correction appropriate for a non-black-
character color to the colorimetric value converted by
said colorimetric value converting step from the CMYK
20 data judged to represent the non-black-character color
by said black-character color judging step; and

the color conversion profile setting step of
setting said color conversion profile by using said
colorimetric value corrected by said colorimetric value
25 correcting step,

wherein said color conversion profile has a characteristic of emphasizing a contrast of the output color data corresponding to the CMYK data representing the black-character color more than a contrast of the output color data corresponding to the CMYK data representing the non-black-character color.

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14. The color converting device as claimed in claim 2, wherein said color conversion profile is created by a color conversion profile creating device including:

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a CMYK data generation unit generating the CMYK data;

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a colorimetric value converting unit converting said CMYK data generated by said CMYK data generation unit into a colorimetric value to be measured with respect to an image formed from said CMYK data by an image forming device;

a black-character color judging unit judging whether or not said CMYK data generated by said CMYK data generation unit represents a black-character color;

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a colorimetric value correcting unit

correcting said colorimetric value by performing a
contrast correction appropriate for a black-character
color to the colorimetric value converted by said
colorimetric value converting unit from the CMYK data
5 judged to represent the black-character color by said
black-character color judging unit, and by performing a
contrast correction appropriate for a non-black-
character color to the colorimetric value converted by
said colorimetric value converting unit from the CMYK
10 data judged to represent the non-black-character color
by said black-character color judging unit; and

a color conversion profile setting unit
setting said color conversion profile by using said
colorimetric value corrected by said colorimetric value
15 correcting unit,

wherein said color conversion profile is
caused to have said characteristic.

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15. The color converting device as claimed in
claim 2, wherein said color conversion profile is
created by a color conversion profile creating method
25 including:

the CMYK data generating step of generating the CMYK data;

the colorimetric value converting step of converting said CMYK data generated by said CMYK data
5 generating step into a colorimetric value to be measured with respect to an image formed from said CMYK data by an image forming device;

the black-character color judging step of judging whether or not said CMYK data generated by said
10 CMYK data generating step represents a black-character color;

the colorimetric value correcting step of correcting said colorimetric value by performing a contrast correction appropriate for a black-character
15 color to the colorimetric value converted by said colorimetric value converting step from the CMYK data judged to represent the black-character color by said black-character color judging step, and by performing a contrast correction appropriate for a non-black-
20 character color to the colorimetric value converted by said colorimetric value converting step from the CMYK data judged to represent the non-black-character color by said black-character color judging step; and

the color conversion profile setting step of
25 setting said color conversion profile by using said

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colorimetric value corrected by said colorimetric value
correcting step,

wherein said color conversion profile is
caused to have said characteristic.

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16. An image forming device forming an image
10 by using CMYK data, the image-forming device comprising:

a color converting device converting the CMYK
data generated in the image forming device into output
color data in a predetermined different format, the
color converting device including:

15 a color conversion profile representing a
correspondence of the CMYK data with the output color
data; and

a color converting unit converting the CMYK
data into the output color data by referring to said
20 color conversion profile,

wherein said color conversion profile has a
characteristic of emphasizing a contrast of the output
color data corresponding to the CMYK data representing a
black-character color more than a contrast of the output
25 color data corresponding to the CMYK data representing a

non-black-character color.

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17. An image forming device forming an image by using CMYK data, the image forming device comprising:

a color converting device converting the CMYK data generated in the image forming device into output color data in a predetermined different format, the color converting device including:

a CMYK/colorimetric-value conversion unit converting the CMYK data into a colorimetric value to be measured with respect to an image formed from the CMYK data by an image forming device;

a black-character color judging unit judging whether or not the CMYK data represents a black-character color;

a colorimetric value correction unit correcting said colorimetric value by performing a contrast correction appropriate for a black-character color to the colorimetric value converted by said CMYK/colorimetric-value conversion unit from the CMYK data judged to represent the black-character color by said black-character color judging unit, and by

performing a contrast correction appropriate for a non-
black-character color to the colorimetric value
converted by said CMYK/colorimetric-value conversion
unit from the CMYK data judged to represent the non-
5 black-character color by said black-character color
judging unit; and

a colorimetric-value/output-color-data
conversion unit converting said colorimetric value
corrected by said colorimetric value correction unit
10 into the output color data,

wherein a contrast of the output color data
corresponding to the CMYK data judged to represent the
black-character color is emphasized more than a contrast
of the output color data corresponding to the CMYK data
15 judged to represent the non-black-character color.

20 18. The image forming device as claimed in
claim 16, wherein said color conversion profile is
created by a color conversion profile creating device
including:

a CMYK data generation unit generating the
25 CMYK data;

a colorimetric value converting unit
converting said CMYK data generated by said CMYK data
generation unit into a colorimetric value to be measured
with respect to an image formed from said CMYK data by
5 an image forming device;

a black-character color judging unit judging
whether or not said CMYK data generated by said CMYK
data generation unit represents a black-character color;

a colorimetric value correcting unit
10 correcting said colorimetric value by performing a
contrast correction appropriate for a black-character
color to the colorimetric value converted by said
colorimetric value converting unit from the CMYK data
judged to represent the black-character color by said
15 black-character color judging unit, and by performing a
contrast correction appropriate for a non-black-
character color to the colorimetric value converted by
said colorimetric value converting unit from the CMYK
data judged to represent the non-black-character color
20 by said black-character color judging unit; and

a color conversion profile setting unit
setting said color conversion profile by using said
colorimetric value corrected by said colorimetric value
correcting unit,

25 wherein said color conversion profile is

caused to have said characteristic.

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19. The image forming device as claimed in claim 16, wherein said color conversion profile is created by a color conversion profile creating method including:

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the CMYK data generating step of generating the CMYK data;

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the colorimetric value converting step of converting said CMYK data generated by said CMYK data generating step into a colorimetric value to be measured with respect to an image formed from said CMYK data by an image forming device;

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the black-character color judging step of judging whether or not said CMYK data generated by said CMYK data generating step represents a black-character color;

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the colorimetric value correcting step of correcting said colorimetric value by performing a contrast correction appropriate for a black-character color to the colorimetric value converted by said colorimetric value converting step from the CMYK data

judged to represent the black-character color by said
black-character color judging step, and by performing a
contrast correction appropriate for a non-black-
character color to the colorimetric value converted by
5 said colorimetric value converting step from the CMYK
data judged to represent the non-black-character color
by said black-character color judging step; and

the color conversion profile setting step of
setting said color conversion profile by using said
10 colorimetric value corrected by said colorimetric value
correcting step,

wherein said color conversion profile is
caused to have said characteristic.

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20. An image forming device forming an image
by using CMYK data, the image forming device comprising:

20 a color conversion profile creating device
creating a color conversion profile used for converting
the CMYK data generated in the image forming device into
output color data in a predetermined different format,
the color conversion profile creating device including:

25 a CMYK data generation unit generating the

CMYK data;

5 a colorimetric value converting unit
converting said CMYK data generated by said CMYK data
generation unit into a colorimetric value to be measured
with respect to an image formed from said CMYK data by
an image forming device;

a black-character color judging unit judging
whether or not said CMYK data generated by said CMYK
data generation unit represents a black-character color;

10 a colorimetric value correcting unit
correcting said colorimetric value by performing a
contrast correction appropriate for a black-character
color to the colorimetric value converted by said
colorimetric value converting unit from the CMYK data
15 judged to represent the black-character color by said
black-character color judging unit, and by performing a
contrast correction appropriate for a non-black-
character color to the colorimetric value converted by
said colorimetric value converting unit from the CMYK
20 data judged to represent the non-black-character color
by said black-character color judging unit; and

a color conversion profile setting unit,
setting said color conversion profile by using said
colorimetric value corrected by said colorimetric value
25 correcting unit,

wherein said color conversion profile has a characteristic of emphasizing a contrast of the output color data corresponding to the CMYK data representing the black-character color more than a contrast of the output color data corresponding to the CMYK data representing the non-black-character color.

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21. The color converting device as claimed in claim 14, further comprising said color conversion profile creating device.

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22. A color converting method for converting input CMYK data into output color data in a predetermined different format, the method comprising:

the CMYK/colorimetric-value converting step of converting the CMYK data into a colorimetric value to be measured with respect to an image formed from the CMYK data by an image forming device;

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the black-character color judging step of

judging whether or not the CMYK data represents a black-character color;

the colorimetric value correcting step of
correcting said colorimetric value by performing a
5 contrast correction appropriate for a black-character
color to the colorimetric value converted by said
CMYK/colorimetric-value converting step from the CMYK
data judged to represent the black-character color by
said black-character color judging step, and by
10 performing a contrast correction appropriate for a non-
black-character color to the colorimetric value
converted by said CMYK/colorimetric-value converting
step from the CMYK data judged to represent the non-
black-character color by said black-character color
15 judging step; and

the colorimetric-value/output-color-data
converting step of converting said colorimetric value
corrected by said colorimetric value correcting step
into the output color data,

20 wherein a contrast of the output color data
corresponding to the CMYK data judged to represent the
black-character color is emphasized more than a contrast
of the output color data corresponding to the CMYK data
judged to represent the non-black-character color.

23. A color converting method for converting CMYK data into output color data in a predetermined different format, the method comprising the step of:

referring to a color conversion profile so as
5 to convert the CMYK data into the output color data, the color conversion profile being created by a color conversion profile creating device including:

a CMYK data generation unit generating the CMYK data;

10 a colorimetric value converting unit converting said CMYK data generated by said CMYK data generation unit into a colorimetric value to be measured with respect to an image formed from said CMYK data by an image forming device;

15 a black-character color judging unit judging whether or not said CMYK data generated by said CMYK data generation unit represents a black-character color;

a colorimetric value correcting unit
correcting said colorimetric value by performing a
20 contrast correction appropriate for a black-character color to the colorimetric value converted by said colorimetric value converting unit from the CMYK data judged to represent the black-character color by said black-character color judging unit, and by performing a
25 contrast correction appropriate for a non-black-

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character color to the colorimetric value converted by
said colorimetric value converting unit from the CMYK
data judged to represent the non-black-character color
by said black-character color judging unit; and

5 a color conversion profile setting unit
setting said color conversion profile by using said
colorimetric value corrected by said colorimetric value
correcting unit,

10 wherein said color conversion profile has a
characteristic of emphasizing a contrast of the output
color data corresponding to the CMYK data representing
the black-character color more than a contrast of the
output color data corresponding to the CMYK data
representing the non-black-character color.

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24. A color converting method for converting
20 CMYK data into output color data in a predetermined
different format, the color converting method comprising
the step of:

referring to a color conversion profile so as
to convert the CMYK data into the output color data, the
25 color conversion profile being created by a color

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conversion profile creating method including:

the CMYK data generating step of generating the CMYK data;

the colorimetric value converting step of
5 converting said CMYK data generated by said CMYK data generating step into a colorimetric value to be measured with respect to an image formed from said CMYK data by an image forming device;

the black-character color judging step of
10 judging whether or not said CMYK data generated by said CMYK data generating step represents a black-character color;

the colorimetric value correcting step of
correcting said colorimetric value by performing a
15 contrast correction appropriate for a black-character color to the colorimetric value converted by said colorimetric value converting step from the CMYK data judged to represent the black-character color by said black-character color judging step, and by performing a
20 contrast correction appropriate for a non-black-character color to the colorimetric value converted by said colorimetric value converting step from the CMYK data judged to represent the non-black-character color by said black-character color judging step; and

25 the color conversion profile setting step of

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setting said color conversion profile by using said colorimetric value corrected by said colorimetric value correcting step,

5 wherein said color conversion profile has a characteristic of emphasizing a contrast of the output color data corresponding to the CMYK data representing the black-character color more than a contrast of the output color data corresponding to the CMYK data representing the non-black-character color.

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25. A computer readable recording medium
15 storing program code for causing a computer to create a color conversion profile used for converting CMYK data into output color data in a predetermined different format, the recording medium comprising:

CMYK data generating program code means for
20 generating the CMYK data;

colorimetric value converting program code means for converting said CMYK data generated by said CMYK data generating program code means into a colorimetric value to be measured with respect to an
25 image formed from said CMYK data by an image forming

device;

black-character color judging program code
means for judging whether or not said CMYK data
generated by said CMYK data generating program code

5 means represents a black-character color;

colorimetric value correcting program code
means for correcting said colorimetric value by
performing a contrast correction appropriate for a
black-character color to the colorimetric value

10 converted by said colorimetric value converting program
code means from the CMYK data judged to represent the
black-character color by said black-character color
judging program code means, and by performing a contrast
correction appropriate for a non-black-character color
15 to the colorimetric value converted by said colorimetric
value converting program code means from the CMYK data
judged to represent the non-black-character color by
said black-character color judging program code means;
and

20 color conversion profile setting program code
means for setting said color conversion profile by using
said colorimetric value corrected by said colorimetric
value correcting program code means,

wherein said color conversion profile has a
25 characteristic of emphasizing a contrast of the output

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color data corresponding to the CMYK data representing the black-character color more than a contrast of the output color data corresponding to the CMYK data representing the non-black-character color.

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26. A computer readable recording medium
10 storing program code for causing a computer to convert input CMYK data into output color data in a predetermined different format, the recording medium comprising:

CMYK/colorimetric-value converting program
15 code means for converting the CMYK data into a colorimetric value to be measured with respect to an image formed from the CMYK data by an image forming device;

black-character color judging program code
20 means for judging whether or not the CMYK data represents a black-character color;

colorimetric value correcting program code
means for correcting said colorimetric value by performing a contrast correction appropriate for a
25 black-character color to the colorimetric value

converted by said CMYK/colorimetric-value converting
program code means from the CMYK data judged to
represent the black-character color by said black-
character color judging program code means, and by
5 performing a contrast correction appropriate for a non-
black-character color to the colorimetric value
converted by said CMYK/colorimetric-value converting
program code means from the CMYK data judged to
represent the non-black-character color by said black-
10 character color judging program code means; and
colorimetric-value/output-color-data
converting program code means for converting said
colorimetric value corrected by said colorimetric value
correcting program code means into the output color data,
15 wherein a contrast of the output color data
corresponding to the CMYK data judged to represent the
black-character color is emphasized more than a contrast
of the output color data corresponding to the CMYK data
judged to represent the non-black-character color.

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27. A computer readable recording medium
25 storing program code for causing a computer to convert

CMYK data into output color data in a predetermined different format, the recording medium comprising:

color conversion profile referring program
code means for referring to a color conversion profile
5 so as to convert the CMYK data into the output color data, the color conversion profile being created by a color conversion profile creating device including:

a CMYK data generation unit generating the CMYK data;

10 a colorimetric value converting unit
converting said CMYK data generated by said CMYK data generation unit into a colorimetric value to be measured with respect to an image formed from said CMYK data by an image forming device;

15 a black-character color judging unit judging whether or not said CMYK data generated by said CMYK data generation unit represents a black-character color;

a colorimetric value correcting unit
correcting said colorimetric value by performing a
20 contrast correction appropriate for a black-character color to the colorimetric value converted by said colorimetric value converting unit from the CMYK data judged to represent the black-character color by said black-character color judging unit, and by performing a
25 contrast correction appropriate for a non-black-

character color to the colorimetric value converted by
said colorimetric value converting unit from the CMYK
data judged to represent the non-black-character color
by said black-character color judging unit; and

5 a color conversion profile setting unit
setting said color conversion profile by using said
colorimetric value corrected by said colorimetric value
correcting unit,

10 wherein said color conversion profile has a
characteristic of emphasizing a contrast of the output
color data corresponding to the CMYK data representing
the black-character color more than a contrast of the
output color data corresponding to the CMYK data
representing the non-black-character color.

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28. A computer readable recording medium
20 storing program code for causing a computer to convert
CMYK data into output color data in a predetermined
different format, the recording medium comprising:

color conversion profile referring program
code means for referring to a color conversion profile
25 so as to convert the CMYK data into the output color

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data, the color conversion profile being created by a color conversion profile creating method including:

the CMYK data generating step of generating the CMYK data;

5 the colorimetric value converting step of converting said CMYK data generated by said CMYK data generating step into a colorimetric value to be measured with respect to an image formed from said CMYK data by an image forming device;

10 the black-character color judging step of judging whether or not said CMYK data generated by said CMYK data generating step represents a black-character color;

the colorimetric value correcting step of
15 correcting said colorimetric value by performing a contrast correction appropriate for a black-character color to the colorimetric value converted by said colorimetric value converting step from the CMYK data judged to represent the black-character color by said
20 black-character color judging step, and by performing a contrast correction appropriate for a non-black-character color to the colorimetric value converted by said colorimetric value converting step from the CMYK data judged to represent the non-black-character color
25 by said black-character color judging step; and

the color conversion profile setting step of setting said color conversion profile by using said colorimetric value corrected by said colorimetric value correcting step,

5 wherein said color conversion profile has a characteristic of emphasizing a contrast of the output color data corresponding to the CMYK data representing the black-character color more than a contrast of the output color data corresponding to the CMYK data
10 representing the non-black-character color.

15 29. A color converting device converting an input color signal into an output color signal by dividing an n-dimensional input color space into a plurality of polyhedral units, dividing each of said polyhedral units into a plurality of solids, and
20 performing an interpolative calculation using interpolation coefficients corresponding to one of said polyhedral units to which said input color signal belongs, where n is a natural number not smaller than 4, the device comprising:

25 storing means for storing n-dimensional

interpolation coefficients corresponding to each of said solids;

determining means for dividing said input color signal into higher-order data and lower-order data,
5 and determining which one of said solids of one of said polyhedral units said input color signal belongs to according to a magnitude relation among said lower-order data, the one of said polyhedral units being selected according to said higher-order data;

10 reading means for reading the n-dimensional interpolation coefficients corresponding to the determined one of said solids from said storing means;

generating means for generating (n-1)-dimensional interpolation coefficients used for an (n-
15 1)-dimensional interpolative calculation from said n-dimensional interpolation coefficients; and

interpolating means for performing said (n-1)-dimensional interpolative calculation by using said lower-order data and said (n-1)-dimensional
20 interpolation coefficients.

25 30. A color converting device converting an

input color signal composed of n color signals into an output color signal by dividing an n -dimensional input color space into a plurality of polyhedral units, dividing each of said polyhedral units into a plurality of solids, and performing an interpolative calculation using interpolation coefficients corresponding to one of said solids to which said input color signal belongs, where n is a natural number not smaller than 4, the device comprising:

10 storing means for storing n -dimensional interpolation coefficients corresponding to each of said solids;

 determining means for dividing each of said n color signals into higher-order data and lower-order data, and determining which one of said solids of one of said polyhedral units said input color signal belongs to according to a magnitude relation among said lower-order data of said n color signals excluding at least one color signal therefrom, the one of said polyhedral units
15 being selected according to said higher-order data;

 reading means for reading the n -dimensional interpolation coefficients corresponding to the determined one of said solids from said storing means;

 generating means for generating $(n-1)$ -
25 dimensional interpolation coefficients used for an $(n-$

1)-dimensional interpolative calculation from said n-dimensional interpolation coefficients; and

interpolating means for performing said (n-1)-dimensional interpolative calculation by using said

5 lower-order data and said (n-1)-dimensional interpolation coefficients.

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31. The color converting device as claimed in claim 29, wherein n is 4, and said interpolating means performs a tetrahedral interpolation as said (n-1)-dimensional interpolative calculation.

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32. The color converting device as claimed in claim 30, wherein n is 4, and said interpolating means performs a tetrahedral interpolation as said (n-1)-dimensional interpolative calculation.

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33. The color converting device as claimed in claim 29, wherein n is 4, and said interpolating means performs a triangular-prism interpolation as said $(n-1)$ -dimensional interpolative calculation.

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34. The color converting device as claimed in claim 30, wherein n is 4, and said interpolating means performs a triangular-prism interpolation as said $(n-1)$ -dimensional interpolative calculation.

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35. The color converting device as claimed in claim 29, wherein said generating means repeatedly generates said $(n-1)$ -dimensional interpolation coefficients from said n -dimensional interpolation coefficients predetermined times so as to generate m -dimensional interpolation coefficients used for an m -dimensional interpolative calculation, where m is smaller than n .

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36. The color converting device as claimed in claim 30, wherein said generating means repeatedly generates said (n-1)-dimensional interpolation coefficients from said n-dimensional interpolation coefficients predetermined times so as to generate m-dimensional interpolation coefficients used for an m-dimensional interpolative calculation, where m is smaller than n.

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37. The color converting device as claimed in claim 29, wherein said generating means generates said (n-1)-dimensional interpolation coefficients by linearly interpolating two of said n-dimensional interpolation coefficients by using said lower-order data.

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38. The color converting device as claimed in claim 30, wherein said generating means generates said (n-1)-dimensional interpolation coefficients by linearly interpolating two of said n-dimensional interpolation

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coefficients by using said lower-order data.

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39. The color converting device as claimed in claim 29, wherein said generating means generates said (n-1)-dimensional interpolation coefficients by using a lookup table containing a differential value of two of said n-dimensional interpolation coefficients and said lower-order data as addresses.

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40. The color converting device as claimed in claim 30, wherein said generating means generates said (n-1)-dimensional interpolation coefficients by using a lookup table containing a differential value of two of said n-dimensional interpolation coefficients and said lower-order data as addresses.

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41. The color converting device as claimed in claim 37, wherein said storing means stores said two of said n-dimensional interpolation coefficients at serial memory address.

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42. The color converting device as claimed in claim 38, wherein said storing means stores said two of said n-dimensional interpolation coefficients at serial memory address.

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43. A color converting method for converting an input color signal into an output color signal by dividing a four-dimensional input color space into a plurality of 16-vertex units, and performing an interpolative calculation using interpolation coefficients corresponding to one of said 16-vertex units to which said input color signal belongs, the method comprising:

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the determining step of dividing said input

color signal into higher-order data and lower-order data,
dividing one of said 16-vertex units selected according
to said higher-order data into six 8-vertex solids, and
determining which one of said six 8-vertex solids said
5 input color signal belongs to according to a magnitude
relation among said lower-order data;

the generating step of generating three-
dimensional interpolation coefficients used for a three-
dimensional interpolative calculation from four-
10 dimensional interpolation coefficients corresponding to
the determined one of said 8-vertex solids; and

the interpolating step of performing said
three-dimensional interpolative calculation by using
said lower-order data and said three-dimensional
15 interpolation coefficients so as to generate said output
color signal.

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44. A computer readable recording medium
storing program code for causing a computer to convert
an input color signal into an output color signal by
dividing a four-dimensional input color space into a
25 plurality of 16-vertex units, and performing an

interpolative calculation using interpolation coefficients corresponding to one of said 16-vertex units to which said input color signal belongs, the recording medium comprising:

- 5 determining program code means for dividing said input color signal into higher-order data and lower-order data, dividing one of said 16-vertex units selected according to said higher-order data into six 8-vertex solids, and determining which one of said six 8-vertex solids said input color signal belongs to
- 10 according to a magnitude relation among said lower-order data;

- generating program code means for generating three-dimensional interpolation coefficients used for a
- 15 three-dimensional interpolative calculation from four-dimensional interpolation coefficients corresponding to the determined one of said 8-vertex solids; and

- interpolating program code means for performing said three-dimensional interpolative
- 20 calculation by using said lower-order data and said three-dimensional interpolation coefficients so as to generate said output color signal.